some of the big-eyed Lancashire witches, and one of the finest ruins in England, amply justified it. The site of Furness Abbey is one of those delicious valleys which the Cistercians always selected for their buildings: the ruins are very extensive, and belong mainly to the latter part of the twelfth century, when the pointed arch was being incorporated with the semi-circular. They occupy a space of ground 680 feet in length by about 400 feet in width, and the grounds enclosed to the monastery altogether were 65 acres. Standing in the centre of the quadrangle, a regular square, with sides of some 180 or 190 feet each in length, you have on the north side the conventual church, a building of extraordinary proportions, with its tower, chancel, transepts, and choir 306 feet in length, the width of the church across the transepts being 190 feet. On the east side of the quadrangle was the refectory, about 200 feet long; the chapter-house and common refectory, with dormitories above (upwards of 200 feet in length); and on the west a magnificent hall, stretching from the chancel of the church to the utmost limits of the southern building (being, in fact, nearly 300 feet in length), which may have served as the hospitium or guests' hall. There was also a long suite of buildings farther south of all these, at right angles, and covering them from east to west, the exact purpose of which has not been determined, though one was apparently a small chapel (the abbot's chapel), and another the hospital.

There are some very interesting early stone effigies scattered about, on which Mr. Planché discoursed pleasantly.

The society here had the advantage of Mr. E. Sharpe's guidance, as well as of an excellent paper from him on the subject, a condensation of which we shall print hereafter.

The Chapter-house is a singularly fine Early English apartment: one of the windows, left unfinished, shows the several steps in working the dog-tooth moulding. The sedilia in the chancel of church, a Perpendicular insertion, are remarkably large and fine.

We must back, however, to Lancaster, where, on Thursday morning, the members were publicly entertained by the inhabitants. A hundred people breakfasted and nine speeches were made in five-and-forty minutes; and then they rushed out to see a bit of the town before starting for Hornby Castle. The castle at Lancaster, as every one knows, is now a prison, and shows little of the old work but the keep. The law courts in it were designed by Gandy. Lancaster church, a building of the Perpendicular period, possesses some extraordinary wood-work of the previous style, in the shape of reredos and stalls, now against the east wall. The history of this wood-work, of which there was formerly much more, is unknown: tradition says it came from abroad. The reredos is especially beautiful. The east window is filled with stained glass: the subject is the Crucifixion, one of the best of Wailes's works. The church is lumbered up with galleries, but it may be hoped that these will not long be suffered to remain. A new font, well designed by Messrs. Sharpe and Paley, was put up in 1848, in connection with a small brass tablet, as a memorial of John Stout, Esq., of Lancaster, in lieu of an ordinary monument. It is octagon in form; stands on two steps, and has figures of the Evangelists in the pedestal.

Hornby Castle, illustrated in our last number, has been recently restored by Messrs. Sharpe and Paley, in good taste. It cost the present possessor, Mr. Pudsey Dawson, twenty years' fighting in law courts, and many thousands of pounds, before he could obtain possession of it, under a disputed will. After a most hospitable and elegant entertainment here, the migratory body (literally *swallows* a little while before) once more started for Manchester, where papers were read on "Ancient Etymologies," by Rev. Dr. Whittaker, of Blackburn; on "The Discoveries at Lymne in Kent," by Mr. Thomas Wright; on "The Traces of the Romans along the banks of the Mersey," by Mr. W. Beamont; Mr. Jas. Thompson on the Roman wall at Leicester; on "Œolophiles," by Dr. Bell, &c. &c., (to some of which we shall refer); a public dinner was eaten; a thanksgiving and wind-up meeting held on the Saturday, and then the members evanished to their several homes, having spent a pleasant, instructive, and useful week.

We must not omit to add that at the closing meeting on Saturday it was resolved, "that, with a view to the advancement of archæological science and the formation of a central museum of British antiquities, it is desirable to promote a union between the British Archæological Association and the Archæological Institute of Great Britain and Ireland; and that this meeting strongly recommends the council to take such steps as to them may seem expedient to accomplish these important objects." We sincerely hope that the Institute will evince a correponding good feeling, and that the endeavour will prove successful.

THE STRUCTURE OF THE NORMAN FORTRESS IN ENGLAND.*

THE Norman castle did not consist of a single building, such as in modern times we often understand by the term, but of a series of fortified erections. The keep, which we now frequently designate the castle, was but a part of the stronghold, and was the resort of the garrison only in times of pressing danger. The castle consisted of the central building, or keep, the upper and lower courts, or baileys, in which were the garrison buildings, with the walls, gates, barbicans, and ditches, intended to promote the general safety. The area occupied by a castle was often very considerable. Norwich Castle covered a space of not less than twenty-three acres. The site chosen for it was usually an elevated spot of ground naturally defended on two or more sides. Excepting in situations where the ground was very precipitous, a ditch was drawn around the enclosure. When the nature of the level would admit of it, the moat was filled with water. On the inside of the ditch a strong wall was raised. This was sometimes thirty feet high, and had a thickness of six or eight feet. On the top of it was a platform, protected by a buttress, for the evolutions of the garrison who manned the fort. The curtain wall of the Norman fortress of Richmond is in a nearly perfect state. Its masonry is of a rougher character than the keep, a large portion of the facing stones being unhewed. The section of it has evidently been the first care of the garrison, as the buildings, which have been placed against its inner margin, have not been tied into it. One or more gateways of course gave access through the wall to the interior space, each of which was defended by a tower and other appliances. The drawbridge and the portcullis belong rather to the Edwardian than the Norman castle, yet examples of them are met with at this period. When the foe attacked the fort the ditch had to be filled up with hurdles or earth before the gate could be reached, and when it was, the uplifted drawbridge formed an additional barrier. In addition to the tower defending a principal gateway, a barbican or advanced work was occasionally added. This was sometimes furnished with a ditch and drawbridge. Besides the principal entrance into the castle, other apertures, which convenience dictated, were provided. These were often very narrow, and were placed in situations so precipitous as to be easily defended. Not unfrequently two or even three walls, each of them provided with a moat, surrounded the fortress. Where concentric walls did not form independent inclosures, a wall was drawn across the general space, dividing it into two courts, called the inner and outer bailey. This enabled the garrison, in case of the outer court being taken, to retreat into the inner. Immediately within the outer walls of the castle, the garrison buildings seem to have been placed. These consisted of the residences of the several officers, a common hall, a place of abode for the soldiery, stables for the horses, and a chapel for the use of the garrison. At Richmond most of these yet remain. The general character of them is dark, gloomy, and comfortless, bearing more of the appearance of dungeons than of the abode of conquerors. We now come to the most remarkable part of the fortress—the keep. This was the retreat of the garrison in the event of the outer and inner baileys being carried by the enemy, and on it, accordingly, the utmost skill of the military architect was lavished. It was generally placed in the centre of the fortification, though this was not universally the case. When circumstances allowed of it, it was placed upon a site more elevated than the rest of the fortress. If the ground did not naturally assume the required form, a forced mount was prepared of the materials taken out of the moats. Clifford's Tower at York is so placed. The general form of the Norman keep is that of a quadrilateral figure, nearly approaching to a square. The great thickness of its walls, and the strength of its masonry, almost superseded the use of buttresses. In buildings of the larger class a smaller tower is attached to the main structure in order to defend the entrance. The cautious policy of the Normans suggested that the door-way of the keep should not be on the ground-floor, but at a considerable elevation. It is generally placed upon the second story. By this means the lower parts of the building, which were more exposed to the battering-rams of the besieging party than the higher, were kept in unimpaired strength, and the attacking party, before reaching the entrance, had to climb a steep staircase, exposed, meanwhile, to the fire of the garrison. In small buildings the entrance stair is left uncovered, but in large fortresses it is uniformly protected by a tower attached to the keep, but still entirely independent of it. The whole of this subsidiary building might be in the hand of the enemy, while the integrity of the citadel remained unimpaired. The masonry of the keep was of the most formidable character imaginable. At Newcastle there is reason to believe that the whole area of the site has been built up solid from a depth of about fourteen feet to the surface of the ground. The thickness of the walls is in most cases enormous. Twelve and fourteen feet is a common thickness; but there are cases, as at Colchester, where they are thirty feet thick at the bottom. They generally taper off in stages, so as to give to the upper apartments increasing size. The stones employed in building these walls are uniformly of excellent quality, and were not unfrequently brought from a considerable distance. They were not usually of a size larger than could be conveniently lifted by a man, and were for the most part square in the face. The *face* of the wall only consisted of regularly squared stones: the interior was composed of grout. The strength of the whole structure chiefly depended upon the character of the mortar employed. In making it the Roman method was adopted. It was poured in a sort of semi-fluid state into its bed, loose rubble being thrust in amongst it: in the course of a few hours the mortar would become solid, and in a few days the wall would present to an enemy a breastwork capable of resisting a battering-ram. Nothing can exceed the firmness of Norman masonry; it is, if possible, harder than unhewn rock. Recently it was necessary to breach the walls of the White Tower, in London, in order to introduce a tram way into it for the conveyance of ordnance stores, and it took a party of sappers and miners six weeks to effect their purpose. The same policy which suggested that, excepting on very rare occasions, no doorway should exist on the ground-floor, required the very sparing introduction of windows. In some instances, as at Richmond, there are none on the ground-floor. The room has depended entirely upon artificial light: the staples fixed in the centre of the vaulting show the places where the lamps have hung. Where windows are introduced, they are of the smallest possible size, being little better than arrow loops. The light which was admitted through the aperture was carefully economised by the increasing width of the window as it approached the inner margin of the wall, and by this means the precious rays were allowed freely to expand themselves. As these holes served the purpose of arrow loops as well as windows, the bottoms of them were generally formed into steps, and on their upper margin was not unfrequently a recess provided to protect the head of the soldier, who stood at it watching his opportunity to project the deadly bolt. In order to defend the garrison within the keep from the action of missiles thrown through these apertures, an ingenious contrivance may often be noticed; the upper portion of the window aperture is made to curve downwards as it approaches the inner margin of the wall, or a stone curtain drops directly down, and against these projections an arrow sent from below would necessarily strike and

* Read at Manchester, by the Rev. J. C. Bruce, of Newcastle-upon-Tyne.

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